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Altherr

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[54] **RAILWAY COUPLER SHANK KEYSLOT CONTOUR**

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Related U.S. Patent Documents

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[52] **U.S. Cl.** ..... **213/64;** 213/67 R; 213/69

[51] **Int. Cl.**[2] **B61G 7/00**

[58] **Field of Search** 213/50.5, 51, 62, 63, 213/64, 65, 67, 69

[56] **References Cited**

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Attorney, Agent, or Firm—Fred P. Kostka; Ralph M. Faust

[57] **ABSTRACT**

The keyslot of a railway coupler shank is modified to eliminate the interference between the coupler shank and draft key during conditions of buff or draft during vertical curve negotiation of the cars when traversing uneven track. The upper and lower walls of the keyslot diverge from the rear bearing surface of the keyslot adjacent the butt of the coupler shank. Thus the keyslot opening is wider in the front portion than at the rear portion.

3 Claims, 8 Drawing Figures

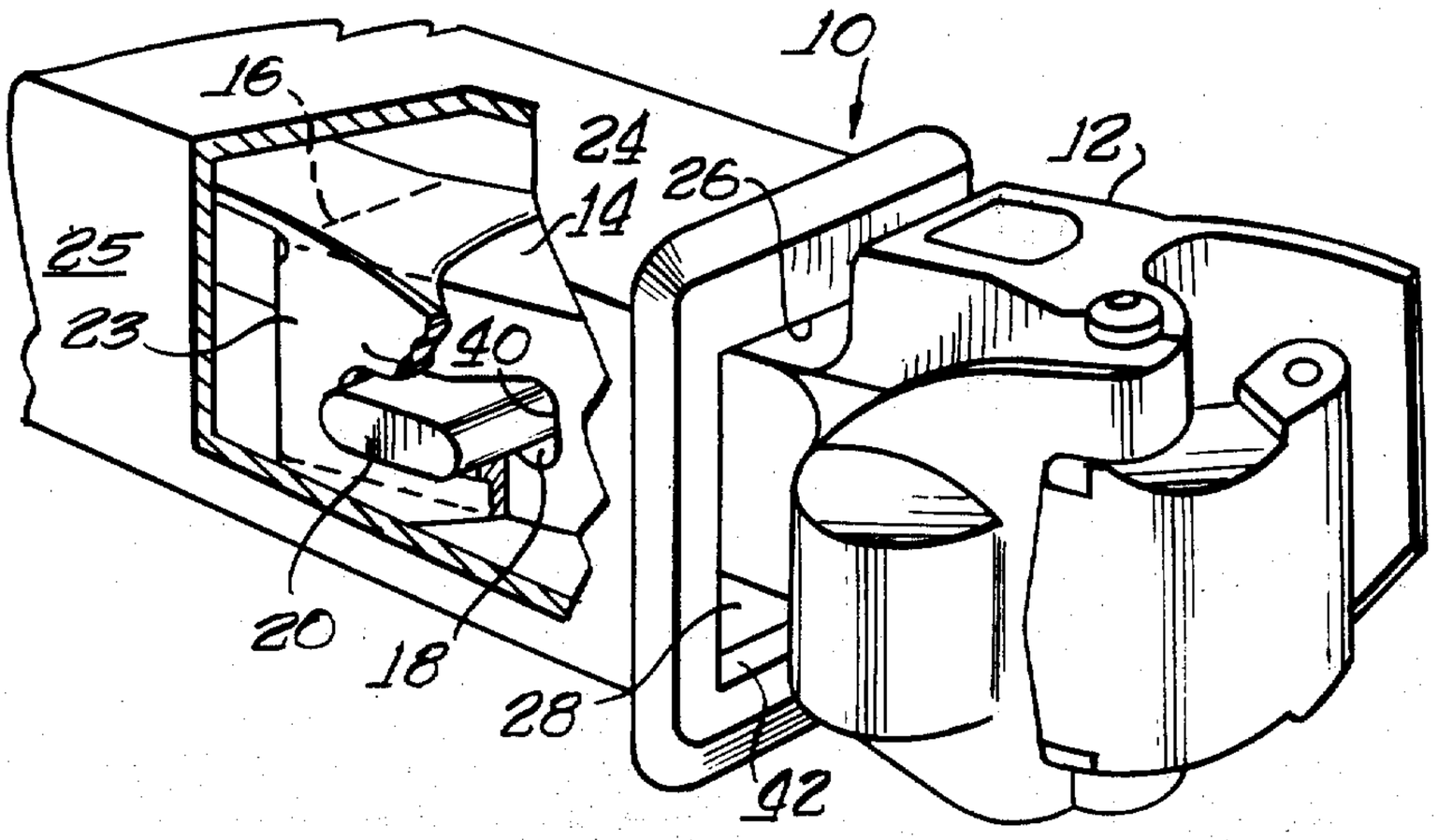


Fig. 1

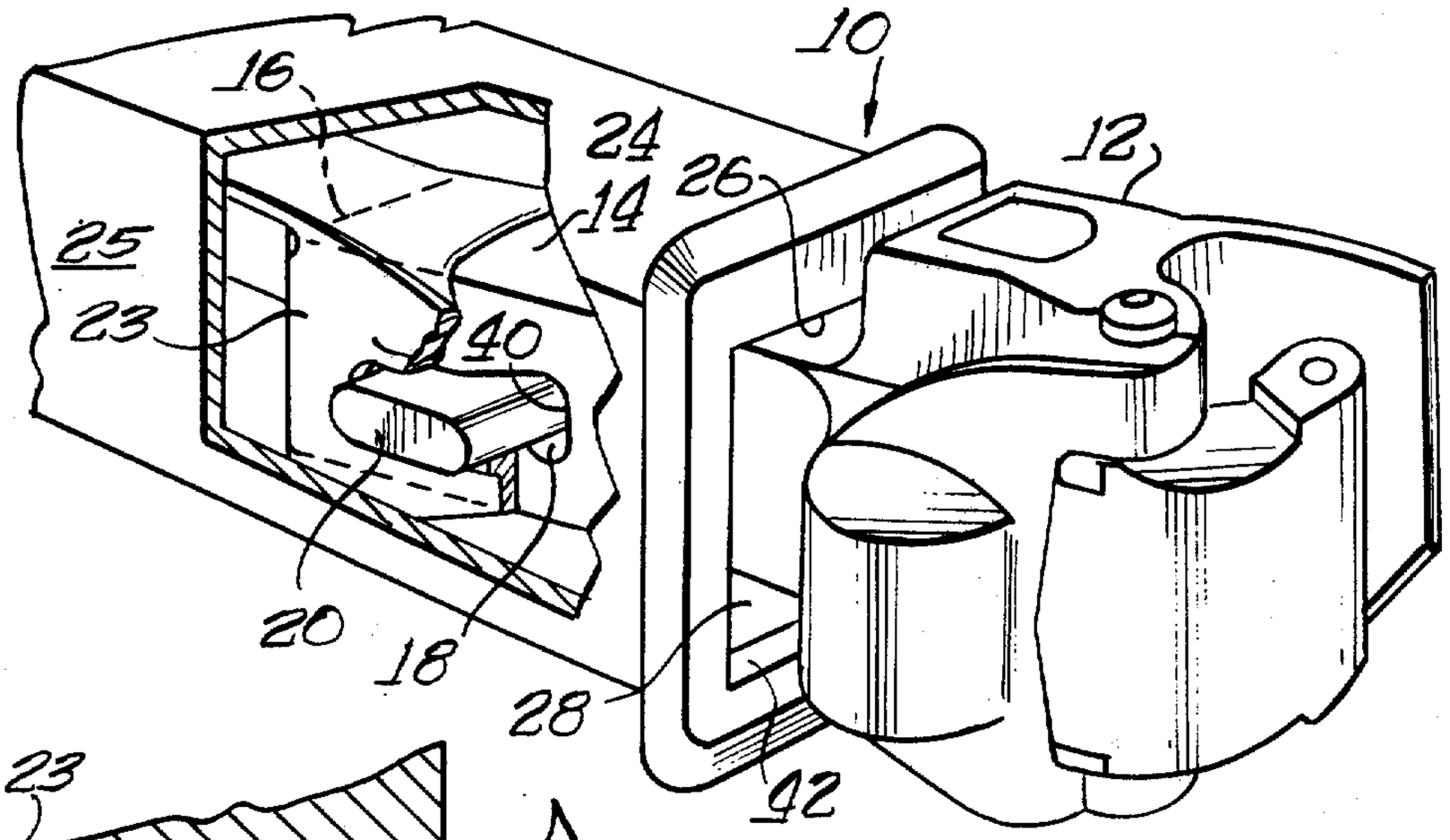


Fig. 2.

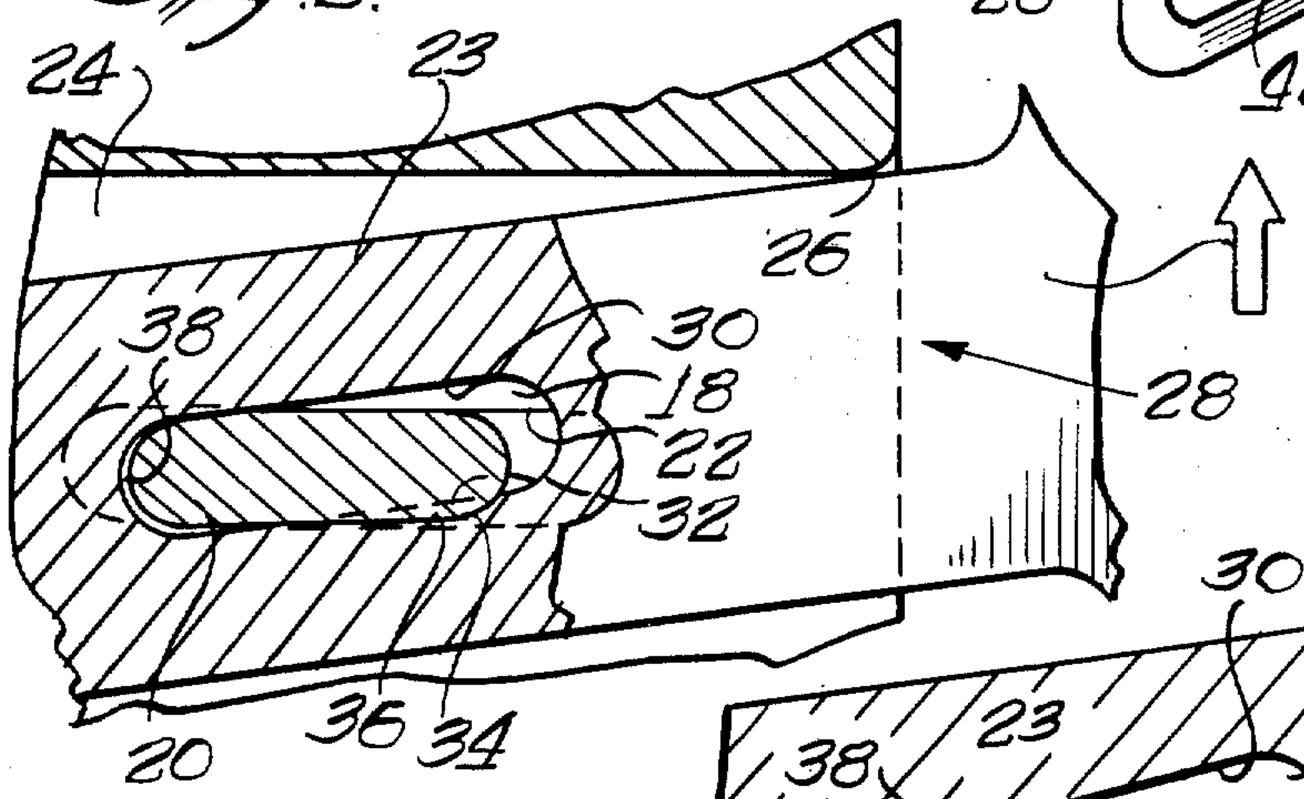


Fig. 3.

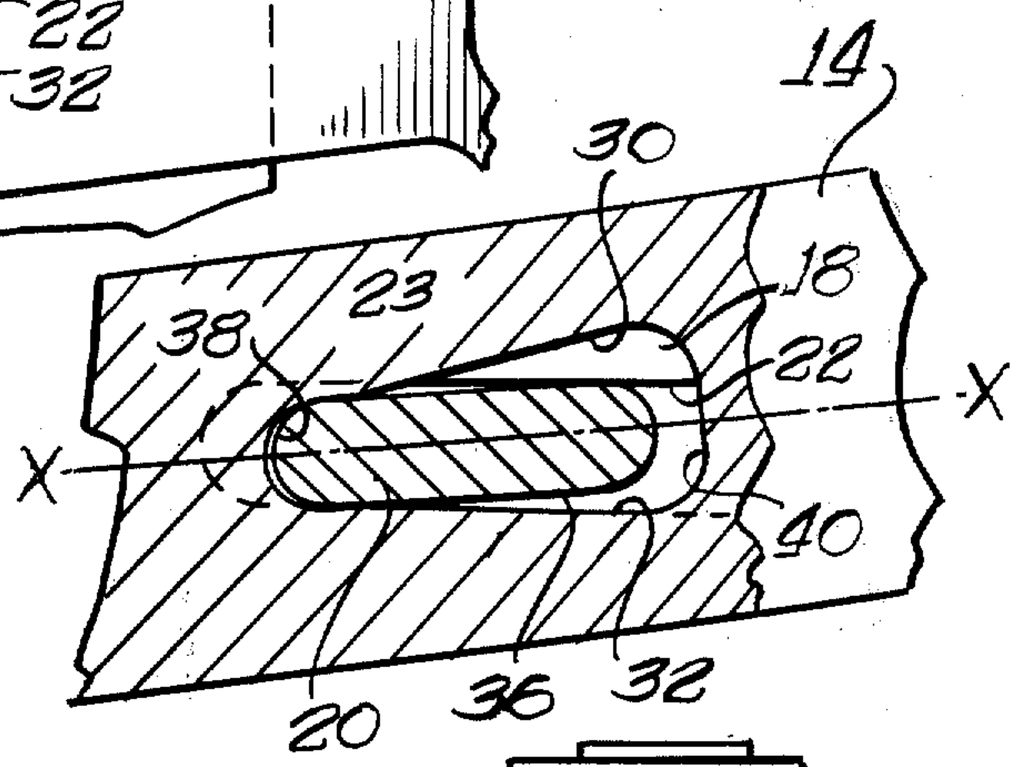


Fig. 4

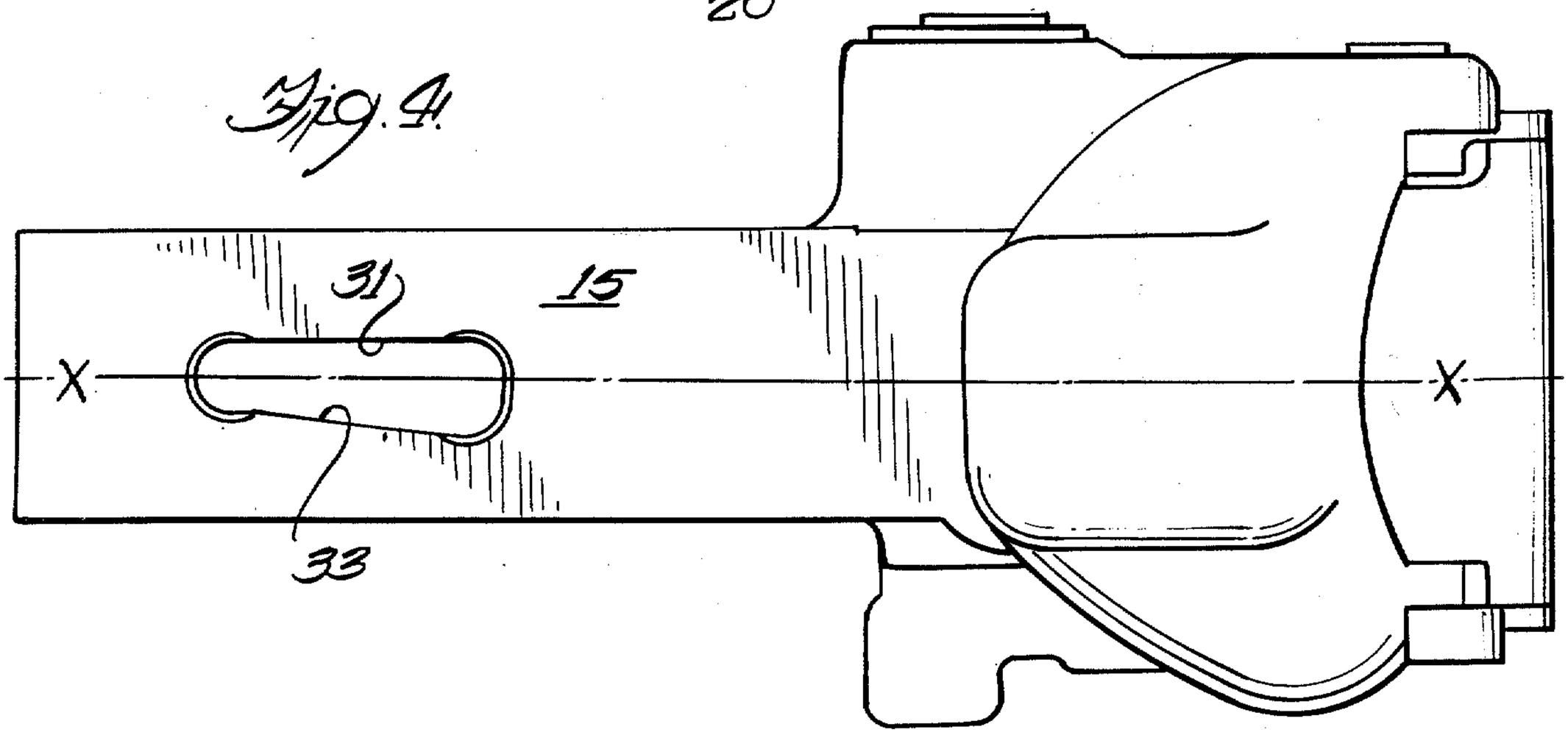


Fig. 5

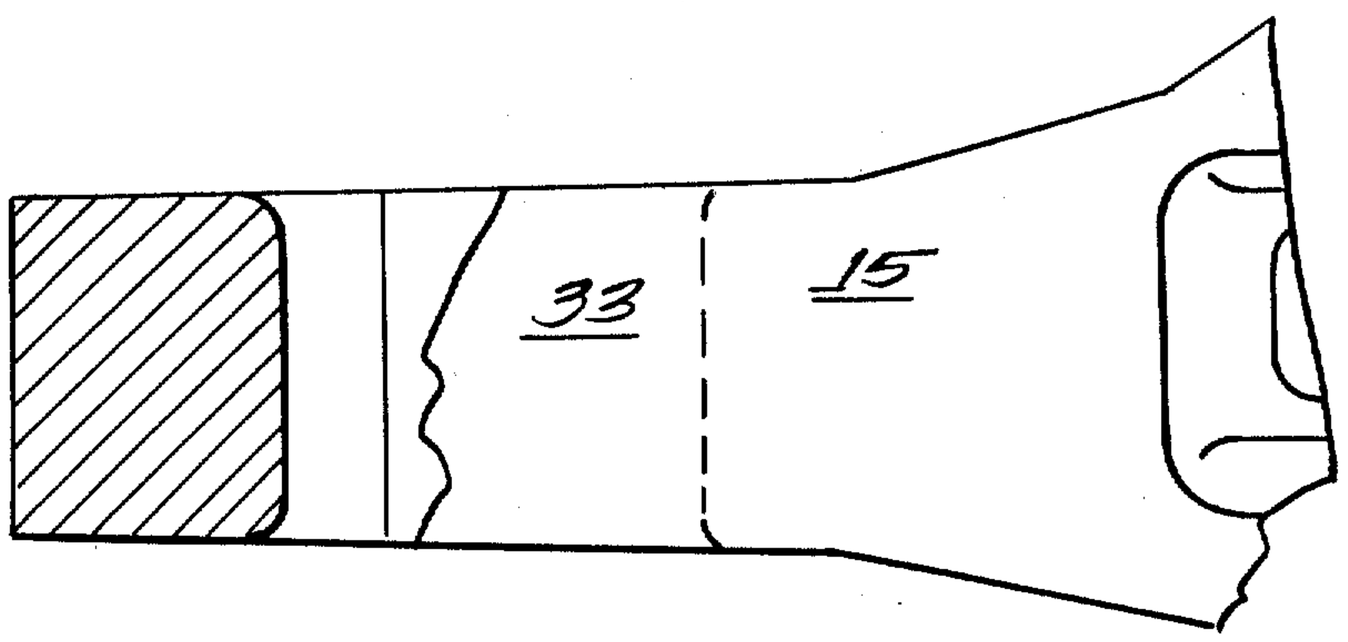


Fig. 6

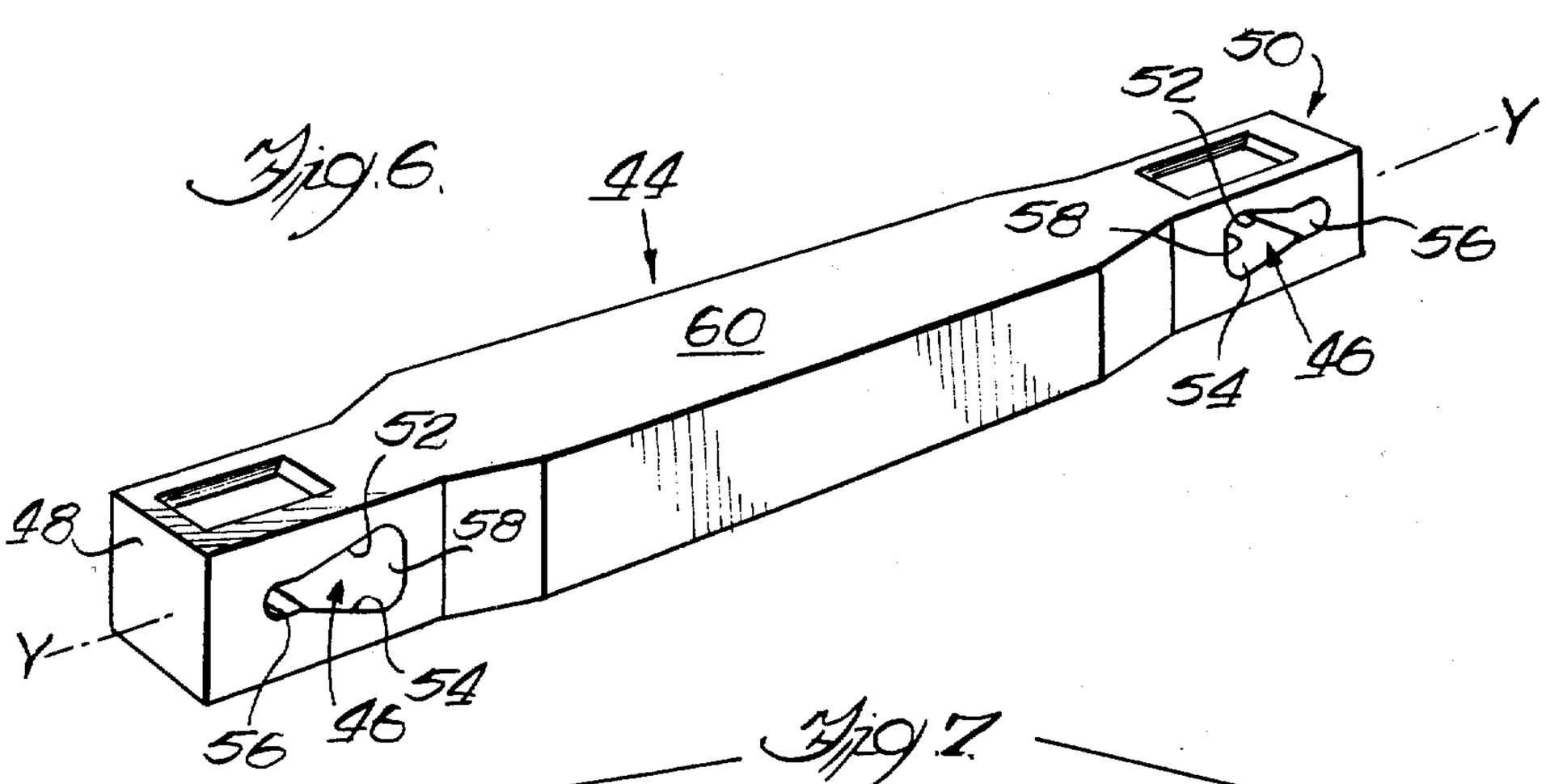


Fig. 7

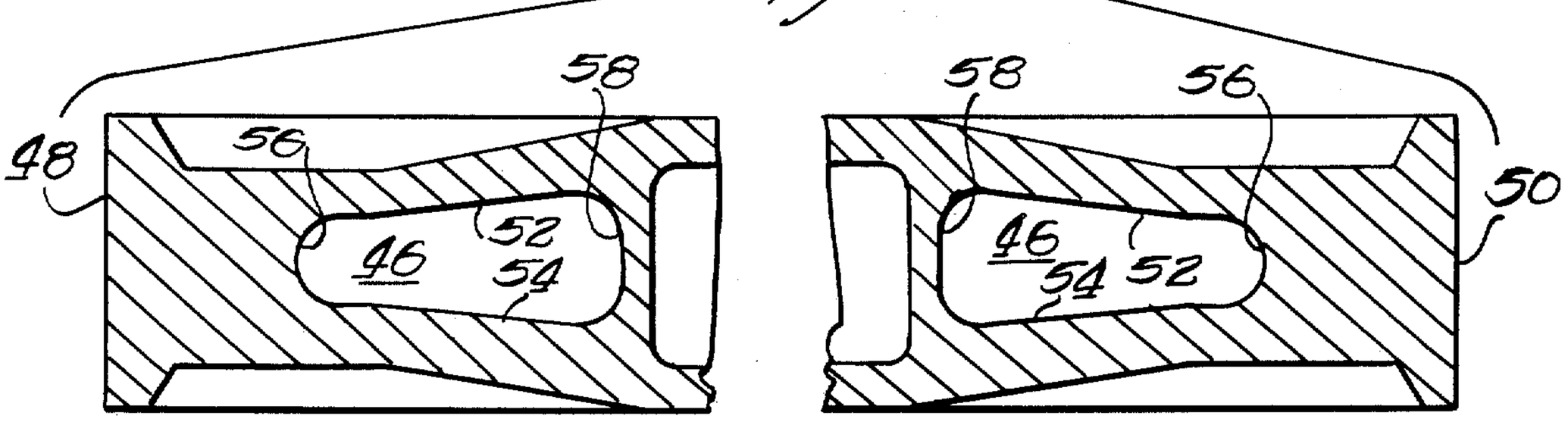
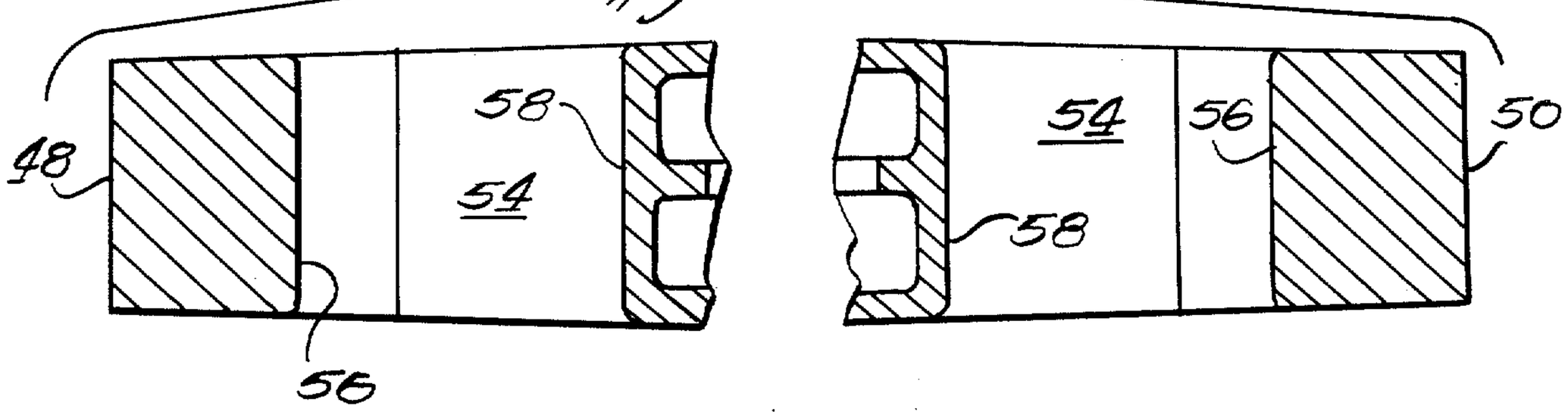


Fig. 8.



RAILWAY COUPLER SHANK KEYSLOT CONTOUR

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue.

BACKGROUND OF THE INVENTION

This patent relates to a railway coupler having a shank with a keyslot therein and a draft key projecting through the keyslot.

Although "E" couplers are not constructed to angle vertically, they do angle vertically under buff or draft loading when negotiating vertical curves. In coupler arrangements currently in use, the striker clearance over the coupler shank of a standard coupler allows more vertical angle than can be accommodated by the clearance of the draft key in the coupler keyslot and in the car center sill keyslot. This clearance can become even greater as a result of wear before it would become necessary to make repairs by adding a shim beneath the top wall of the striker opening.

It is for the above reasons that any upward force applied at the coupler pulling face may induce such adverse conditions as bent draft keys, draft keys exhibiting excessive local wear or even coupler shanks being split at the forward portion of the keyslot. In addition, excessive wear can occur on the top and bottom of the striker keyslot due to buff or draft motion while the coupler is angled vertically.

Many of the aforementioned problems in extreme cases can have serious results; for example, a severely bent draft key would be more susceptible to failure under draft loads and can restrict lateral motion of the coupler.

OBJECTS OF THE INVENTION

The present invention overcomes the beforementioned difficulties and limitations by providing an improved coupler keyslot contour which eliminates interference between the draft key and the coupler shank keyslot.

Accordingly, it is the object of the invention to provide an improved coupler keyslot contour for a railroad coupler shank that allows vertical angulation of the coupler head and shank within the striker casting without encountering interference between the draft key and coupler shank.

Another object of the invention is to provide a new and novel improved keyslot contour that provides sufficient vertical angulation to enable the use of an "F" coupler head on an "E" type coupler shank.

A further object of the invention is to provide a new and novel improved keyslot contour in each end of a solid drawbar that provides at each end of said drawbar adequate vertical angulation required for the cars when traversing vertical curves and negotiating uneven sections of track.

These and other objects and advantages of the invention will become apparent from a study of the attached drawings and from a reading of the description of the preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a standard-type railroad E-coupler vertically angled in a striker, a portion of the striker and yoke being removed to show the relation between the new keyslot contour and the draft key.

FIG. **2** is a side elevational view of a coupler shank proximate the butt end, a yoke keyslot and striker, the assembly being partly in section and showing the interference conditions between the fixed yoke keyslot, shank keyslot, and draft key in prior art arrangements (This is the only figure showing the prior art shank keyslot contour).

FIG. **3** is a view similar to that of FIG. **2** showing the use of the improved keyslot contour in relieving the interference conditions that had existed in prior art arrangements.

FIG. **4** is a side elevational view of a standard-type "E" coupler shank showing one embodiment of the improved keyslot contour of the invention.

FIG. **5** is a plan view, shown partially in section, of the butt end of the coupler shank shown in FIG. **4** showing one embodiment of the improved keyslot contour of the invention.

FIG. **6** is a perspective view of a solid drawbar showing an embodiment of the improved keyslot contour on each end thereof.

FIG. **7** is a fragmentary sectional side view taken on the longitudinal axis Y—Y of FIG. **6** illustrating the embodying features of the invention.

FIG. **8** is a fragmentary plan view in section taken on the longitudinal axis Y—Y of FIG. **6** illustrating the embodying features of the invention.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now more particularly to the drawings, there is shown in FIG. **1** a standard-type railroad E-coupler positioned in a car end, (although an F-coupler could be used in this embodiment) shown generally at **10,** which comprises a coupler head **12** having attached thereto a coupler shank **14** which terminates at the butt end **16** of the coupler shank **14.** The butt end **16** of the coupler **10** contains a horizontal keyslot **18** that extends laterally through shank **14** adjacent the butt **16.** The keyslot **18** is positioned to receive a load transmitting draft key **20** which simultaneously passes through keyslot **18,** similar fixed keyslots (not shown) located on each side of the striker casting **24** (only one side of which is shown) and similar yoke keyslots **22** located on either side of the yoke **23,** also fixed except for limited longitudinal motion. Both the yoke **23** and striker casting **24** receives the coupler shank **14** of the coupler **10.** Each yoke keyslot **22** is generally longer than the keyslot **18** located in the coupler shank **14** so as to accommodate longitudinal travel of the coupler **10** and coupler shank **14** under buff conditions.

When the coupler **10** is under buffing conditions the coupler load is transmitted through the butt end **16** to the draft gear (not shown) which is housed behind the butt end **16** of the coupler **10** in the car center sill **25.** In such a buff condition, the draft key **20** is unloaded and allowed to move rearward in the yoke keyslots **22** of the yoke **23** with no buff loading between the keyslot **18** and the draft key **20.**

When the coupler **10** is under straight pulling conditions the coupler load is transferred to the yoke **23** by

means of the draft key **20.** Under these conditions the draft key **20** is in the forward-most portion of the yoke keyslots **22.**

The prior art arrangements permitted adequate horizontal angling of the coupler **10** under both buff and draft loading.

Because E-couplers do not have the vertical angulatory freedom associated with the common F-type coupler many are under the impression that E-couplers do not angle vertically. However they do angle vertically under either buff conditions or during draft loading during vertical curve negotiation of cars and when the cars are traversing uneven track. For example in a new assembly, the nominal striker clearance over the coupler shank **14** of a standard E-coupler **10** is approximately ⅞ of an inch. If the coupler were allowed to rise through that full clearance that would result in more angle than can be accommodated by the clearance between the draft key **20** in the coupler keyslot **18** while the draft key **20** is being denied rotation by the yoke keyslot **22** and simultaneously in the keyslot (not shown) in the striker casting. This clearance can become as large as 1½ inches before it is necessary to make repairs by adding a shim beneath the top wall **26** of the striker opening **28.**

For a clearer understanding of the interference conditions that can occur between the draft key **20** and the coupler shank **14** during vertical angulation of the coupler **10;** reference is made to FIG. **2** of the drawings.

The yoke keyslots **22** in the yoke **23** are substantially horizontal relative to the coupler shank **14** which is shown in a condition of maximum vertical angulation wherein the coupler shank **14** engages the top wall **26** of the striker opening **28.** The yoke keyslots **22** limit the rotation of the draft key **20** which is being forced to rotate because of the forces being applied to it by the upper wall **30** and lower wall **32** of the keyslot **18** in the coupler shank **14.** Thus the amount of interference that exists is illustrated by the area of overlap **34** between the lower wall **32** of the coupler keyslot **18** and the lower surface **36** of the draft key **20.**

FIG. **3** illustrates the new and improved contour for the coupler keyslot **18** wherein the upper wall **30** and lower wall **32** diverge away from the longitudinal axis X—X of the coupler shank **14** in a forwardly direction away from the butt end **16** toward the coupler head **12.** Thus relatively narrow spacing is maintained between the upper wall **30** and lower wall **32** of the keyslot **18** at the rear bearing surface **38** adjacent the butt end **16** and relatively wide spacing is maintained between the upper wall **30** and lower wall **32** of the keyslot **18** at the forward bearing surface **40** proximate the coupler head **12.**

Use of the new improved contour for the coupler keyslot **18** as illustrated in FIG. **3** clearly shows that the interference condition that existed in prior art arrangements has been eliminated, as clearance now exists between the lower wall **32** of the keyslot **18** and the lower surface **36** of the draft key **20.**

Referring now to FIGS. **4** and **5** there is shown a modification of the improved keyslot contour of the invention wherein the upper wall **31** is substantially parallel to the longitudinal axis X—X and the lower wall **33** diverges in a forwardly direction away from the longitudinal axis X—X and the upper wall **31.**

The contour of FIG. **3** may be used on an "E," "F" and solid drawbar arrangements, whereas the modification shown in FIG. **4** is intended for use only with an

E-type coupler arrangement. The reason being that only upward vertical angulation must be accommodated inasmuch as the carrier **42** (FIG. **1**) prevents the coupler from angling downward; thus interference between the upper wall **31** of the shank **15** and the draft key (not shown) is not a problem.

FIGS. **6** through **8** illustrate a solid drawbar **44** using the improved keyslot contour. The improved keyslot contour makes possible the use of a solid drawbar **44** with an E-type striker casting **24** and yoke **23** similar to that shown in FIG. **1.** Such an arrangement is made possible as a result of the increased vertical angulation derived from the improved keyslot contour.

The preferred embodiment of the keyslot contour is illustrated in FIGS. **6** through **8** once again in conjunction with the solid drawbar **44** wherein a keyslot **46** having the improved contour is located near the butt ends **48** and **50** of the drawbar **44** with each keyslot **46** passing laterally through the drawbar **44** perpendicular to the longitudinal axis **7—7** of the drawbar **44.**

The upper wall **52** and lower wall **54** of each keyslot **46** diverge away from the outward bearing surface **56** adjacent the drawbar butt ends **48** and **50** and toward the inward bearing surface **58** proximate the widened mid-section **60** of the drawbar **44.** Thus each of the keyslots **46** becomes wider as it approaches the mid-section **60** of the drawbar **44.**

The new improved keyslot contour as previously described may be used in connection with many other coupling arrangements not specifically set forth herein. For example an E-type shank having the improved keyslot contour and mounted within an E-type yoke in conjunction with a spring supported carrier, could then be equipped with an F-type coupler head. Use of an F-type coupler head and an E-type shank would afford greater safety than a standard E-coupler assembly at less cost than a standard F-coupler assembly.

While all of the objects and advantages of the invention have been provided for in the embodiment and modification shown, it is apparent that many changes in details of construction may be made without departing from the spirit and scope of the invention, which is expressed in the accompanying claims and the invention is not to be limited to the exact matters shown and described since only the preferred embodiment has been given by way of illustration only.

I claim:

1. In a railway coupler shank having a longitudinal axis extending the length of said shank from front to rear, the improvement comprising; a substantially horizontal keyslot in the rear portion of said shank extending between the vertical sides and through said shank perpendicular to said longitudinal axis for receiving a key attaching said shank to a draft gear yoke and extending through a slot in the sides of a striker casing; said keyslot having spaced upper and lower surfaces, said upper surface being substantially parallel to the longitudinal axis of said coupler shank and said lower surface diverging downwardly and forwardly away from said upper surface, said upper and lower surfaces merging with forward and rear bearing surfaces.

2. In a railway coupler shank having a longitudinal axis extending the length of said shank from front to rear, the improvement comprising; a substantially horizontal keyslot in the rear portion of said shank extending between the vertical sides and through shank perpendicular to said longitudinal axis for receiving a key attaching said shank to a draft gear yoke and extending through a

slot in the sides of a striker assembly; said keyslot having spaced upper and lower surfaces, said upper surface having a portion substantially parallel to the longitudinal axis of said coupler shank merging with a rear bearing surface and said lower surface having a diverging portion diverging downwardly and forwardly away from said upper surface merging with a forward bearing surface.

3. In a railway coupler shank having a longitudinal axis extending the length of said shank from front to rear, the improvement comprising a substantially horizontal keyslot in the rear portion of said shank extending between the vertical

sides and through said shank perpendicular to said longitudinal axis for receiving a key attaching said shank to a draft gear yoke and extending through a slot in the sides of a striker assembly; said keyslot having spaced upper and lower surfaces each with a rear portion substantially parallel to a longitudinal axis of said coupler and merging with rear bearing surface and a forward portion of at least one of said surfaces diverging from the longitudinal axis forwardly from said parallel rear portions and connected to a forward bearing surface.

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